4-H National Headquarters

Program of Distinction

4-H Wildlife Stewards (4-H WLS)

Abstract

As teachers respond to the demands of educational reform and strive to meet increasing pressures of educational benchmarks and standards, there is less and less time to utilize innovative teaching techniques. Education reform expectations, coupled with increasing class size and shrinking budgets has significantly impacted the way that science education is delivered in schools. *4-H Wildlife Stewards, a Master Science Educator's Program* was developed in response to these emerging concerns in science education. The program is based on the premise that trained volunteer Master Science Educators, as 4-H Wildlife Stewards, can play a role in science education by providing science learning opportunities that teachers are unable to do in the current educational climate. 4-H Wildlife Stewards are trained parent and community volunteers who:

- Work in partnership with teachers, students, parents, and other volunteers to develop a habitat or other natural science projects on school grounds. The habitat is then used as an outdoor science laboratory.
- Assist in helping youth develop and evaluate research projects in the habitat.
- Assist teachers in science education by providing materials, curricula and science expertise.
- Teach and lead science inquiry lessons in the habitat.

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Program of Distinction Category

Natural Resources Education
Leadership Development
Youth Action
Community Engagement

Sources of Funding that Support this Program

- National Science Foundation (NSF) $890,636 competitive grants
- Multnomah County Title III Grants. $102,000 competitive grant.
- Weyerhaeuser Foundation, $2000 competitive grant.
- Oregon 4-H Foundation, $7400 competitive grant.
- Earth Day Every Day Foundation, $600 competitive grants.
- METRO Regional Government Greenspaces Grant, $20,895 competitive
- grants.

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- OSU Water Quality Initiative, $19,150 grant.
- OSU Extension Innovative Grants, $25,832 competitive grants.

Knowledge and Research Base

This project establishes a methodology for improving the quantity and quality of science education through the use of trained Master Volunteer 4-H Wildlife Stewards Volunteers (WLS). The evaluation of the project has revealed a conceptual model of how science learning is enhanced through the presence of trained adult volunteers who work with teachers, schools, and students to construct wildlife habitats on school grounds that are used for informal science inquiry.

This new 4-H model is in line with emerging research on school and community connections. Creating and supporting strong school and community connections is a critical component of building capacity. These studies have found that connections between the student's primary environments—school, community, and family—are key elements of this developmental approach. Several authors (Lewis & Henderson, 1998; Shirley, 1997) suggest that the increased leadership capacity which results from parent and community engagement in school innovations and reform results not only in improved schools, but also in stronger social networks and capacity throughout the community.

The 4-H WLS Program Model also supports research on family and community connections. In the past, research on family and community connections has generally emphasized formal and programmatic approaches to creating connections. However, there is also evidence that more one-on-one, relationship-oriented interactions between educators, parents, and community members are a key factor in making connections and effectively supporting student achievement, school reform, and community development (Wynn, Meyer, & Richards-Schuster 2000; Adams & Christenson, 2000; Mapp, 1999; Scribner, Young, & Pedoza, 1999; Setisinger, 1996). Research has suggested that relationship building and trust are at the core of successful school outreach and community involvement. Community-based education reformers also observe that effective school-community connections depend on building strong, trusting, relationships between schools and parents and between parents and community advocates (Lewis & Henderson, 1998; Wynn et al., 2000). Evidence suggests that 4-H WLS volunteers alone cannot drive a successful program. 4-H WLS volunteers must work collaboratively with each of the stakeholders represented in the model. The role of staff is critical in this model. According to the Southwest Educational Development Laboratory 2001 report, an emerging concept from the literature is that of an intermediary organization or individual as a bridge builder between schools, families, and the community (Honig, 2001; Cordiero & Kolek, 1996). These intermediaries are also referred to as "cultural brokers" and "boundary spanners."

It is clear - responsibility for providing rich and varied opportunities to develop essential skills and competencies for youth is not the school's alone. Parents and communities play an important role as well. Learning and development take place and are equally affected by what happens in and out of school. The 4-H Wildlife Stewards Program Model provides the system, training and support for both families and educators to ensure that all children and youth have access to diverse

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developmental opportunities in their homes, neighborhoods, and schools by helping parents overcome barriers and get involved in schools.

Needs Assessment

The 4-H WLS program began as a response to three critical issues facing Oregonians:

1) A growing public concern over the deterioration of our environment and the resulting loss of wildlife habitat;

2) Oregon Science Education Standards: Classroom teachers today are working hard to meet science education standards, and at the same time, are facing shrinking financial resources and rising class sizes. As teachers respond to the demands of educational reform and strive to meet the increasing pressures of educational benchmarks and assessment, a counter reality is occurring: teachers are finding less and less time to utilize innovative teaching techniques in their classroom due to budget cutbacks and crowded classrooms. The result is that while teachers may receive training on new and innovative ways to teach, few are able to implement these strategies in the classroom. Likewise, parents and community members were looking for a way to become actively involved in caring for the environment as well as supporting their schools. Families and communities realize that the education of our youth is the responsibility of all, not just schools.

3) Local Needs Assessment: A 2007 Oregon School Garden survey found that while many existing Oregon schools with gardens valued the gardens for the education benefits they provide and the way they engaged children, they also faced many obstacles. The top challenges as reported are: summer care (68%), time constraints (65%) and costs (63%). Practical gardening concerns and whims of nature presented many challenges – inadequate irrigation (45%), lack of supplies and equipment (32%), space (16%), damage from wildlife and lack of gardening knowledge (16%) were cited. Support from community and school is also mentioned as a stumbling block – lack of interest from teachers (33%), student interest (4%), district and community support (3%), and vandalism (28%).

The 4-H WLS program addresses these issues. The 4-H WLS Program model, a new model for delivering 4-H education, demonstrates that volunteers trained in building community capacity and how to work collaboratively with schools and community partners are making a difference in the lives of thousands of youth and helping youth become good stewards of our environment.

Goals and Objectives

- ☐ To improve science and math skills, knowledge and attitudes among youth (As a result of the program or curriculum, participants will increase their understanding and interest in math and science.)
- ☐ To increase school and community capacity to deliver high quality science education programs for youth through trained 4-H Wildlife Stewards (As a result of the program, the teachers and volunteer coaches will increase their ability to lead projects in science, math, service learning, and stewardship by supporting and promoting natural landscapes in their schools and communities
- ☐ To increase the quality and quantity of wildlife habitats by promoting

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stewardship among youth and supporting teachers, students, parents and community members to create and sustain wildlife habitat education sites. (As a result of this program, the number teachers and volunteer coaches who lead projects to create, use and sustain wildlife habitat sites at their schools will increase; As a result of this project the amount of school grounds converted and/or enhanced for wildlife habitat will increase.)

Target Audience

1) Youth in grades K-12 in Oregon urban, rural and suburban schools will be targeted. Schools will be recruited through by local 4-H staff through print and electronic promotions, current 4-H leaders, and networking with school administrators and local partners; and 2) Parent and community volunteers are recruited from the schools and local community with the help of school Parent Teacher Associations, school administrators and staff, community partners and natural resource agencies.

Type of program

A unique feature of this new 4-H program model is that it provides 4-H youth participants the opportunity to participate through one or more delivery modes. 4-H youth participate in 4H WLS through School enrichment programs, organized after-school 4-H clubs, resident camp programs, school age childcare programs, and short-term special interest programs.

Delivery Methods

4-H WLS pay on average $90 to undergo a 24-hour 4-H WLS training, and commit to a minimum of 50 hours of service to a local school. The training course sessions include tours to demonstration sites, training in staged pedagogy, principles of wildlife management, landscape design, wildlife habitat requirements, science teaching strategies, curriculum demonstrations, mobilizing community support, science benchmarks and standards, managing science kits and supplies, summer maintenance, the experiential learning model, building a community science team, grant writing, vandalism prevention, working with media and project sustainability. 4-H WLS work in teams of two or more and are assigned to a "member" school. To become a Member School, a representative from the local school must complete an application and be interviewed. Applicant school sites are screened and selected for their commitment to informal science education, natural science projects and their ability to support volunteers. Member Schools must secure funds for garden and habitat supplies and materials, recruit additional parent and community volunteers, attend a community member site representative orientation, gain site approval from the school district, city, or other appropriate jurisdiction and ensure that the project is planned, designed, and sustained in collaboration with youth. 4-H Member schools incorporate one or more program delivery methods including school enrichment, after-school 4-H clubs, 4-H Youth Summits, summer resident camps, and after-school child care programs.

4-H WLS are trained parent and community volunteers. They are trained to support culturally diverse community-based programs in both urban and rural

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communities by: 1) Participating in community site planning committees to ensure project longevity; 2) Working in teams with small groups and large classes to research and develop a wildlife habitat project such as a wetlands restoration, bird garden, interpretive trails, nest boxes or others; 3) Recruiting and scheduling the support of science professionals to serve as youth mentors; 4) Assisting youth in the design, development, and evaluation of research experiments; 5) Assisting teachers in presenting lessons and activities in or about the project; and 6) Helping youths keep portfolios of their work and document their project

Curricula and/or educational materials

There are many educational resources and curricula that support the 4-HWLS program. A three-day (24-hour) training program has been developed for 4-H WLS volunteers and teachers. A 4-H WLS Trainers Guide (200 pages) was developed for 4-H Staff and Faculty as a tool for delivering this training in their local area.

During the training, several developed education materials are used and distributed to the 4-H WLS including 1) 4-H WLS Volunteer Handbook (82 pages); 3) 4-H WLS Project Sustainability Guide (150 pages); 5) 4-H WLS Classroom Curriculum (over 40 hands-on science lessons); and a 95-minute training video series. A 4-H WLS Web course (20 learning modules) has also been developed and course participants receive the same resources.

4-H staff provide ongoing support for teachers and youth who are enrolled as 4-H Member Schools. Some of the resources that teachers and 4-H after-school leaders at the WLS member schools receive are: 1) 4-H WLS Student Journal (32 pages); 2) 4-H Junior WLS After-school Club Curriculum Series; 3) 4-H WLS Member School Teacher and Parent Curriculum Training (3-6 hour training); 4) a one-week Summer Camp Program for Junior WLS (3-12 grade students); 5) a one-day 4-H WLS Statewide Student Summit; and 6) Oregon Native Plant Flash cards. A 4-H Wildlife Stewards website with over 100 web pages has also been developed and is used by 4-H staff, WLS volunteers, parents, youth and the general public.

Teamwork and Collaboration

Currently the OSU Extension 4-H Youth Program, in collaboration with local school districts, parent groups and community partners, mobilize parent and community support for raising youth achievement toward higher math and science skills and increase public understanding for challenging science programs through the 4-H WLS Program. Through the support from the National Science Foundation, this program was designed to become a national model for training and supporting science education parent volunteers to work with community-based science programs.

Program Evaluation

a. Methods: Evaluation of the 4-H WLS program includes the following: 1) an assessment of the overall impact of the program on youth participants skills, knowledge and attitudes toward science and environmental stewardship; 2) an assessment of the leadership experiences of the 4-H WLS volunteers, participating teachers and After-school Program Site Directors; and 3) an assessment of the

program model for replication, sustainability and relevance to minority and under-served youth audiences.

b. Process: Evaluation data was collected through the following methods: *A full copy of this comprehensive evaluation (112 pages) is available upon request.*

*End of Training Data Collection***:** End-of-session surveys were given to participants at each of the 11 trainings from 2001-2004. Time was set-aside at the end of the training for participants to complete the survey. The surveys gathered information about the quality and effectiveness of the training, and measured participant's pre and post knowledge levels in specific content areas. Of the 184 participants in the trainings, 177 provided end-of-session evaluation data.

*Volunteer Summative Follow-up Evaluation***:** Surveys were mailed to 55 volunteers identified as currently active by the 4-H WLS program staff during the spring of 2004 (the end of year). Surveys were returned by 41 volunteers for a response rate of 75%.

*Teacher Summative Follow-up Evaluation***:** Surveys were mailed to 77 teachers identified as active by the 4-H WLS program staff during the spring of 2004 (the end of year 3). Surveys were returned by 39 of the teachers, for a response rate of 51%. Of the 39 respondents, 14 had gone through the 4-H WLS training, 25 had not. All analyses on these data were screened for differences between the groups of teachers who had been through the training and those who had not. There were no significant differences between the groups with one important exception: teachers who had been through the training were significantly more interested in using the habitat to teach science.

Project Sustainability Evaluation: Data on community sites and volunteers was collected and compiled all 5 years of the project. Information on 106 community sites was collected. Data collected on the inactive sites included when they became inactive and why they became inactive. Likewise data on the 343 volunteers trained during this same time period was collected and included when they became inactive and their reasons for dropping out of the program.

*Volunteer Focus Groups on Project Sustainability***:** Twenty-five out of approximately 130 active WS volunteers participated in a 2004 state WS conference. During the first day of the conference the volunteers were divided into 3 small focus groups of 8-9 per group. Each of these groups represented a mix of volunteers who had been involved in the program for long-term (3-5 years), short-term (1-2 years) and less than one year.

Youth Focus Groups to Measure Long-term Impacts: Focus groups were held spring 2005 to hear the views of 4th - 6th grade students who had been involved with 4-H WS for more than 2 years. School principals, teachers, and parents supplied names and gave permission for inclusion of the project. Five to seven students participated at six different schools in four counties.

After-school Program/Club Evaluations: The summative evaluation sought input from youth participants and After-school site directors to assess the 4-H/After-school school program in several key areas: 1) change in attitudes regarding appreciation and knowledge of natural resources 2) the experience of participating in the program; and 3) how youth have changed as a result of the program. At the end of the program, youth and school site directors were asked to reflect on their experience. A pre/post self report assessment of attitude change

was included. Eighteen (64%) SUN school site directors responded to the survey and 193 (62%) of youth responded to the survey. A total of 163 students from 7 after school clubs in grades Kindergarten through 5th grade participated in the evaluation of the 4-H after-school club program. 4-H members were also asked questions on how the 4-H Wildlife Steward club affected their abilities in science and if this program helped them to like science better as a result.

c. Outcomes Evaluation: The lessons learned from delivering informal science education in a systematic way that ultimately helps young people develop and improve their skills, and increase their knowledge and interest in science have been crucial to the incremental success of this program and will largely affect the future success of this program. It is also hoped that the lessons learned from the 4-H WLS Educators program will provide insight for other informal science educators hoping to develop and implement similar models.

At the heart of the 4-H WLS Program is the belief that local citizens trained and supported to work in cooperation with formal educators, community partners, and parents to deliver hands-on science education for children will ultimately provide a more relevant and sustainable science education program. Experiments in participation have demonstrated time and again how much force and vitality people can unleash when they feel they have a stake in the direction of their lives.

Self-report data from students, volunteers and teachers all indicated that the 4-H WLS program has a worthy impact on student interest and skill in science. It is clear that the Habitat Education projects makes science learning fun for the students and they feel skilled at making observations and collecting science data using the habitat. In addition, many of the students report that the program helped them to enjoy science and perform science better. Furthermore, teachers gave fairly high ratings of the program's impact on student science interest, and to a slightly lesser degree, the impact of the program on student science skills. In addition, teachers revealed that the 4-H WLS program had helped them to teach science differently, primarily though providing resources and opportunities for hands- on science learning.

One-hundred and eight-four new 4-H WLS volunteers were trained between October 2001 and May 2004. Participants included 107 adult volunteers, 62 classroom teachers and 15 OSU Staff members. At the conclusion of the trainings, 4-H WLS self reported they felt well prepared to teach science informally (4.06 on a 1-5 scale with 5 high), how to locate resources (4.04) and how to develop school habitats (4.17). Follow up surveys were sent to 55 trained volunteers who were identified as currently active (6 months or more) 4-H WLS. Surveys were returned by 75% of participants. Participants reported significant positive changes in 13 areas including teaching science informally, creating a successful habitat project, project- based learning, and science inquiry. Forty-one percent of the teachers who returned surveys gave high ratings to the active use of the habitat to teach science.

Youth Participant focus groups revealed that 4-H WLS Volunteers enabled students to get outside, do hands-on science, do work which helped the environment and school, and learn about nature. They had fun and saw other students in a new and positive setting. Students learned how to do science, and reported that it was interesting, fun, not as difficult as they previously thought, and enabled them to study things they cared about. When challenged that outdoor

learning was not as important as school science, the students disagreed. They pointed to more learning because of the reality they encountered. They said that classroom learning was enhanced by the 4-H WLS activities. Focus group results found unexpected support for separate standardized testing programs (e.g., state benchmark tests) in some, but not all, sites. In some sites students were virtually unanimous in reporting positive effects on their standardized (and class) testing as a result of their 4-H WLS experience. Students said that their attitudes toward science, school, and each other were improved as a result of their 4-H WLS experience. A common theme was that, as a result of 4-H WLS, students saw science to be less distant, difficult, boring, and inaccessible. Students also reported that 4-H WLS gave them a chance to be successful in school, and with classmates, in ways that were different from conventional classroom activity.

One of the goals of the program is to increase the level of parent, family and community involvement in the school as a result of the project. On a 1-5 scale with 5 being the highest, 64% of teachers and 68% of volunteers rated the increase in parent involvement a 3 or higher. 64% of teachers and 63% of volunteers rated the increase in family involvement a 3 or higher. Lastly, 74% of teachers and 70% of volunteers rated the increase in community involvement a 3 or higher.

Six month follow up surveys, with seven key site personnel (principals, teachers, etc) indicated that on a scale of 1-5, with 5 being excellent, there was an average score of 4.57 on the schools' receptivity to the idea of a wildlife habitat as an informal science classroom. They reported average scores above 4.0 on the ability of 4-H WLS to work with teachers, students and people from different cultures. They also reported an average score of 4.0 for 4-H WLS' effectiveness in garnering resources for the site and 4.0 for 4-H WLS' overall effectiveness in the school. A Summary of the program evaluation impacts are as follows:

- The 4-H WLS Program brings science alive for thousands of Oregon school children through hands-on science activities whether they are conducted during school, after-school, or through special programs.
- Formative evaluations of the program revealed that training provided volunteers with the skills and knowledge to work with students, teachers, community partners and schools to create, use and sustain habitat sites on school grounds;
- Once habitats are in place, they are used as informal science classrooms, allowing teachers to engage students in self- directed, long-term, inquiry-based investigations. In program evaluations, students and teachers report that student interest and knowledge in science increased as a result this project. Teachers also report that this type of engaging informal science learning would not be possible if it were not for the active involvement of 4-H WLS volunteers;
- Follow-up evaluations revealed an increase in parent and community involvement in the school as a result of the program;
- On average, 4-H WLS volunteers brought in an additional $5500 in grants and donations to their school science programs;
- Teachers and principals report a reduction in school vandalism once a project has begun.

d. Communication to stakeholders Today, the program is communicated to stakeholders, including National Science Foundation, community partners, volunteers and school districts, through an annual program summary.

Evidence of Sustainability

In 1997, the first class of 14 4-H WLS was trained with a small grant of $1500. How did this small program with a few dollars and a handful of dedicated volunteers spread into a program that has grown to a program that has trained over 500 volunteers who have supported hundreds of thousands of youth in 120 sites? A key aspect is that the program is based on facilitative change, not just skill acquisition. 4-H WLS volunteers are the organizers, dreamers, visionaries and catalysts for change in their local communities. By recruiting and supporting other parent volunteers and teachers 4-H WLS impact an entire community. As an example, one Oregon 4-H Staff works with 350 club-based volunteers, and these volunteers in turn work with 1400 youth. Another agent, using the 4-H WLS model, works with 11 volunteers. These 11 volunteers recruit and support 134 teachers and 50 parent volunteers to deliver hands-on science education to 2843 youth.

Through new methods of delivering youth education, 4-H demonstrates that in the end what underlies successful unified programs of change is a bedrock belief that change is possible and that people can radically transform their behavior, beliefs, policies and practices with the right kind of impetus. 56% of 4-H WLS Member Schools responded to a survey. On average, each month, 42% of students spent 1-2 hours in hands-on learning related to this project, 33% spent 3-5 hours a month in hands-on science and 25% spent 6-15 hours per month in hands on science. This is significantly higher than traditional 4-H club members spend each month in 4- H hands-on learning.

Project sustainability is a key ingredient to the success of this program. One-third of the training 4-H WLS receive is devoted to project sustainability. Unlike traditional 4-H volunteers, 4-H WLS volunteers are trained in many aspects of sustainability including how to secure grants and resources, how to recruit and manage community partners and other parent volunteers, how to form and run a school habitat team and how to work with the media. 4-H WLS Member schools also participate in the program Project Sustainability Certification Program. There are four levels of project sustainability in the 4-H WLS Program. Each level includes 25-30 requirements that schools must meet to demonstrate their efforts to deliver increasingly sophisticated science education, self-sustainability and growth. A team of 4-H and Extension staff and other local experts conduct certification visits at each school when they complete the requirements for each level of certification. Mini grants, awards and media press releases are used to reward the schools for reaching a new certification level. The Project Sustainability Certification Program not only gives schools and volunteers a roadmap of steps to take to ensure program sustainability, but it also rewards those schools who work toward certification. It also provides 4-H staff with the tools they need to manage and support school programs to reach self-sufficiency.

Replicability

4-H WLS can easily be replicated at the local or county area on a small scale. 4-H Extension faculty can purchase the 4-H WLS Volunteer Handbook, Project Certification Handbook, Habitat Education Site Toolkit DVD, and Trainers Guide. These tools will provide local 4-H staff with the information and resources they need

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to develop the program in their area. 4-H volunteers in any part of the state can also take the on-line 4-H WLS web course and begin the program in their community as long as they have buy-in from the county 4-H staff. An initial investment for printing promotional materials will be necessary. Training fees cover the costs of curriculum and teaching supplies. However, in order to be truly effective and to make a system-wide impact, it is recommended that this program will need to have buy-in at the state 4-H office level. Additionally, the state office will need to commit to the following resources: 1) send a training team to Oregon or bring an Oregon team to their state to participate in a "Train the Trainers Workshop"; 2) commit a minimum of .25 to .50 FTE for a statewide coordinator; 3) purchase and use the 4-H WLS Volunteer Handbook, 4H WLS Trainers Guide, 4-H WLS Habitat Education Site Toolkit DVD, and 4-H WLS Project Certification Handbook to develop this program.

Rationale and Importance of Program

The 4-H WLS program involves collaboration among teams of volunteers, teachers and researchers and key partnerships involving schools, universities and public and private enterprises. Through this program 4-H WLS has established a methodology for improving the quantity and quality of science education through the use of trained volunteers. This model demonstrates that a school or community that enlists the support of 4-H WLS will more likely demonstrate a successful, viable and sustainable program. Informal science education programs that involve community partnerships with schools are not only more likely to be sustained for a longer period of time, but they also improve student skills, knowledge and interest in science. When taken nationally, the model will be an effective tool for increasing the effective use of trained volunteers in informal science education. Furthermore, this trained cadre of informal science educators is the delivery mechanism for reaching youth with some of the high quality science curriculum already developed by 4-H staff across the nation. A strong investment in high-quality science education is essential if we are to prepare our children for productive employment, healthy lifestyles, knowledgeable and contributing citizenship, strong family formation and other adult responsibilities. A great deal of experimentation in the area of school-community collaboration is already underway. Although this rich base of activity is promising, much work remains if collaboration among education and other organizations is to truly enhance our investment in children's sustained development and success.

The 4-H WLS Program is a demonstrated viable and successful model for bringing informal science education to our nation's youth through clearly defined roles for parent and community partners.

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